R&S®CMX500
RADIO COMMUNICATION TESTER

Specifications

Data Sheet
Version 03.01

ROHDE&SCHWARZ
Make ideas real

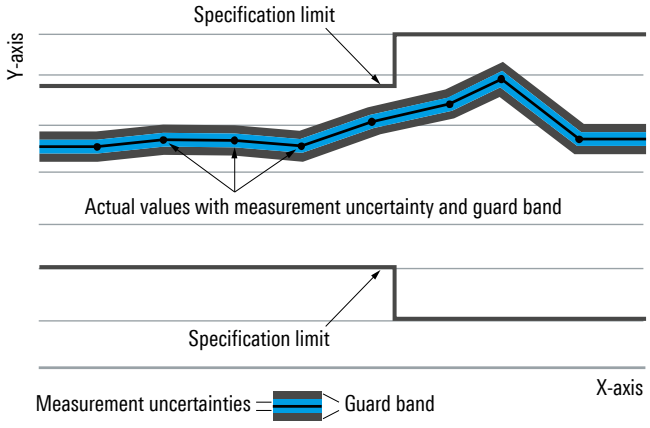
CONTENTS

Definitions

General
Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

Specifications with limits
Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as <, ≤, >, ≥, ±, or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



Non-traceable specifications with limits (n. trc.)
Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

Specifications without limits
Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

Typical data (typ.)
Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)
Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)
Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties
Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are indicated as follows: “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP/3GPP2 standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bits per second (Gbps), million bits per second (Mbps), thousand bits per second (kbps), million symbols per second (Msps) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, Msps, kbps, ksps and Msample/s are not SI units.

Introduction

The R&S®CMX500 radio communication tester is a universal network emulation and measurement test solution supporting latest 3GPP 5G NR technology. In combination with the R&S®CMW500, it supports both 3GPP 5G NR standalone (SA) and non-standalone (NSA) mode with LTE anchor cell and integrated end-to-end data testing within an integrated solution.

Testing within the 3GPP FR2 frequency range can be conducted by combining the R&S®CMX500 with the R&S®CMXHEAD30 remote radio head (RRH), which is a separate compact unit that performs upconversion and downconversion from IF to 5G NR FR2 frequency ranges.

The split concept with the R&S®CMX500 and the R&S®CMXHEAD30 allows short RF cable lengths at the 5G NR FR2 frequency range for an optimal link budget in radiated chamber test environments like the R&S®CMQ500 shielding cube or the R&S®ATS800R CATR rack based antenna test system.

Vector signal analysis and ARB generator are built-in capabilities of the R&S®CMX500 that allow efficient RF parametric testing of both FR2 transmitters and FR2 receivers.

Receiver tests of 5G NR devices under 3GPP fading propagation conditions can be performed using the internal baseband fading emulation.

The R&S®CMX500 can be used in all product development and lifecycle phases – from early R&D to service.

General specifications

Timebase OCXO, high performance

Maximum frequency drift	in temperature range from 0 °C to +50 °C, referenced to +25 °C	$\pm 5 \times 10^{-9}$
	with instrument orientation	$\pm 1 \times 10^{-9}$
Retrace	at +25 °C, after 24 hours power on/ 2 hours power off/1 hour power on	$\pm 5 \times 10^{-9}$
Maximum aging	at +25 °C, after 10 days of continuous operation	$\pm 3 \times 10^{-8}$/year, $\pm 5 \times 10^{-10}$/day
Warm-up time	at +25 °C, the frequency is in the range that is 10 times the frequency drift ($\pm 5 \times 10^{-8}$)	approx. 10 min

Reference frequency inputs/outputs

Synchronization input		BNC connector: Ref. In, rear panel
Frequency	sine wave, square wave	10 MHz
Lock-in range	narrow	$\pm 7.5 \times 10^{-7}$
Input voltage range		0.5 V to 2 V (RMS)
Impedance		50 Ω
Synchronization output		BNC connector: Ref. Out, rear panel
Frequency		10 MHz from internal reference or frequency at synchronization input
Output voltage		> 1.4 V, peak to peak
Impedance		50 Ω

RRH Ref (prerequisite: R&S®CMX-B500A option)

Synchronization output	port 1, port 2, port 3	SMA connector: RRH Ref
Frequency		500 MHz
Power level		> +5 dBm

Modulation source: arbitrary waveform generator (ARB) (prerequisite: R&S®CMX-B500A option and R&S®CMX-KW601 option)

Memory size		8 Gbyte
Word length	I/Q	32 bit
	marker	8 bit
Sample length		up to 1.5 Gsample
Maximum sample rate		1.25 GHz
Maximum possible RF bandwidth	depending on arbitrary waveform file	1 GHz

Accelerator unit (R&S®CMX-B200A option)

The R&S®CMX-B200A option enables accelerated digital signal processing capabilities, including two high speed digital I/Q interfaces to connect to other Rohde & Schwarz instruments.

Digital I/Q high speed interface

DIG. IQ HS 1 and DIG. IQ HS 2		
Interface	direction	full duplex
	connector	QSFP+
	level	CML
	data rate	40 Gbps

Processing unit (R&S®CMX-B300A option)

The R&S®CMX-B300A option facilitates a generic computing platform for advanced data processing, including two high speed LAN switch interfaces and a USB 3.0 data interface to connect to other Rohde & Schwarz instruments.

LAN Ethernet interface

LAN switch 1	R&S®CMX500 subnet only	QSFP+, 1 Gbps, 10 Gbps, 40 Gbps
LAN switch 2	R&S®CMX500 subnet only	Ethernet RJ-45 connector, 1 Gbps

USB interface

R&S®CMX-B300A option	for future use	USB 3.0

IF unit (R&S®CMX-B500A option)

The R&S®CMX-B500A option provides vector signal analysis and ARB based generator functionality in the IF frequency range.

Interfaces		
IF In	IF input, port 1, port 2, port 3	SMA
IF Out	IF output, port 1, port 2, port 3	SMA
RRH Ref	500 MHz reference frequency, port 1, port 2, port 3	SMA
RRH Control	power and control proprietary interface port 1, port 2, port 3	10-pin socket
Sensor 1, sensor 2, sensor 3	for R&S®NRPMx OTA power sensors	8-pin socket

IF generator

IF Out	port 1, port 2, port 3	SMA
Frequency range	inclusive modulation bandwidth	6 GHz to 20 GHz
Frequency resolution		< 0.1 Hz
Frequency uncertainty		same as timebase + frequency resolution
Frequency settling time		< 300 µs

Output level range	maximum reverse power	0 V DC, +25 dBm
	6 GHz to 14 GHz	
	PEP, for best SNR/IMD performance	–20 dBm to +2 dBm
	PEP, overrange	up to +10 dBm
	14 GHz to 20 GHz	
	PEP, for best SNR/IMD performance	–20 dBm to +2 dBm
	PEP, overrange	up to +10 dBm

Output level resolution		0.1 dB

Output level uncertainty	in temperature range from +15 °C to +35 °C, no overranging, within ±5 °C from last level alignment procedure temperature	
	6 GHz to 20 GHz	< 1.5 dB

Output level repeatability	typical values after 1 h warm-up time, always returning to same level and frequency, no temperature change, insignificant time change	< 0.1 dB

Level linearity, with fixed RF output attenuator setting (digital gain)	in temperature range from +15 °C to +35 °C, no overranging	
	level range from 0 dB to –20 dB	< 0.1 dB (nom.)

Isolation of IF ports	IF In_x to IF Out_y	–60 dB (nom.)
	IF Out_x to IF Out_y	–30 dB (nom.)

Attenuation of second harmonics	6 GHz to 20 GHz	> 35 dB (nom.)

Attenuation of third harmonics	6 GHz to 20 GHz	> 45 dB (nom.)

Error vector magnitude	5G NR PDSCH, channel bandwidth: 100 MHz, full allocation, SCS: 60 kHz/120 kHz, modulation: 64QAM in temperature range from +15 °C to +35 °C, within ±5 °C from last level alignment procedure temperature, for signal with PAR = 11.8 dB	
	6 GHz to 10 GHz, –28 dBm to –10 dBm (RMS)	< –40 dB (meas.)
	10 GHz to 14 GHz, –28 dBm to –10 dBm (RMS)	< –37 dB (meas.)
	14 GHz to 17 GHz, –26 dBm to –10 dBm (RMS)	< –37 dB (meas.)

mmWave RF generator

Only in combination with accessories R&S®CMXHEAD30 remote radio head and R&S®CM-Z30A connection cable.

The R&S®CMXHEAD30 is a separate compact unit that performs upconversion and downconversion to 5G NR FR2 frequencies.

Duplex mode		half duplex (TDD)

R&S®CMXHEAD30	port RF1, RF2	wear adapter, 2.4 mm (Q), female
Frequency range	28 GHz band	24.25 GHz to 31.80 GHz
	39 GHz band	37.00 GHz to 43.50 GHz
Frequency resolution		< 0.1 Hz
Frequency uncertainty		same as timebase + frequency resolution

Output level range	maximum reverse power	0 V DC, +25 dBm
	28 GHz band, PEP	–84 dBm to +20 dBm
	37 GHz to 40 GHz, PEP	–78 dBm to +19 dBm
	40 GHz to 43.5 GHz, PEP	–78 dBm to +17 dBm

Output level resolution		0.1 dB

Output level uncertainty	in temperature range from +15 °C to +35 °C, no overranging, within ±5 °C from last level alignment procedure temperature	
	28 GHz band, –50 dBm to +15 dBm, CW	< 2.5 dB
	39 GHz band, –45 dBm to +10 dBm, CW	< 3.0 dB

Output level repeatability	typical values after 1 h warm-up time, always returning to same level and frequency, no temperature change, insignificant time change	< 0.2 dB

Error vector magnitude	5G NR PDSCH, channel bandwidth: 100 MHz, full allocation, SCS: 60 kHz/120 kHz, modulation: 64QAM, in temperature range from +15 °C to +35 °C, within ±5 °C from last I/Q alignment procedure temperature, for signal with PAR = 11.8 dB	
	28 GHz band, P from –22 dBm to +3 dBm (RMS)	–35 dB (meas.)
	37 GHz to 40 GHz, P from –22 dBm to –2 dBm (RMS)	–35 dB (meas.)
	40 GHz to 42 GHz, P from –22 dBm to –2 dBm (RMS)	–34 dB (meas.)

Isolation	RF1 to RF2	> 27 dB, 35 dB (typ.)

IF analyzer

IF In	port 1, port 2, port 3	SMA
Frequency range	inclusive modulation bandwidth	4 GHz to 20 GHz
Frequency resolution		< 0.1 Hz
Frequency uncertainty		same as timebase + frequency resolution

Level range	absolute maximum values	0 V DC, +25 dBm

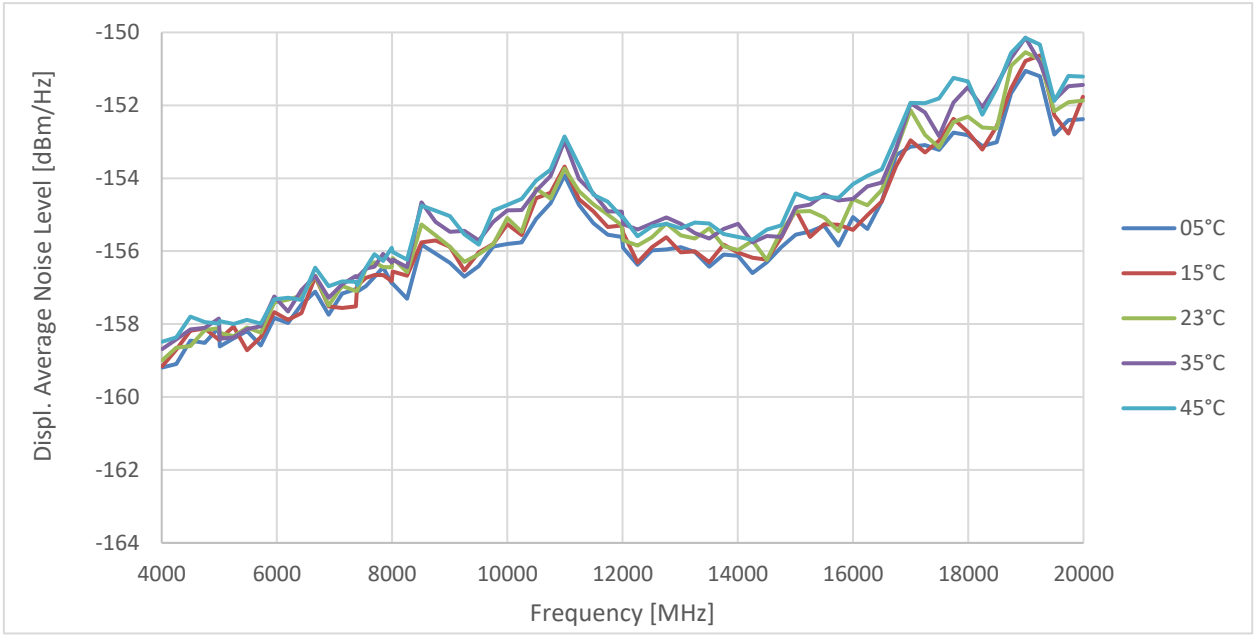
Expected nominal power setting range	PEP, for ADC full scale	
	4 GHz to 20 GHz	–5 dBm to +15 dBm

Level uncertainty	in temperature range from +15 °C to +35 °C, no overranging, within ±5 °C from last level alignment procedure temperature	
	4 GHz to 20 GHz, P > –45 dBm (RMS)	< 1.5 dB
	in temperature range from +15 °C to +35 °C, no overranging, within ±5 °C from last level alignment procedure temperature, firmware version (base) ≥ 4.0.7 and hardware code of TRX_BB (part of R&S®CMP-B500A IF unit) < 11	
	4 GHz to 7.38 GHz and 8.0 GHz to 20 GHz	< 2.5 dB

Level repeatability	typical values after 1 h warm-up time, always returning to same level and frequency, no temperature change, insignificant time change	< 0.1 dB

Level linearity, with fixed expected nominal power setting	in temperature range from +15 °C to +35 °C, no overranging	
	level range from 0 dB to –20 dB	< 0.1 dB (nom.)

Displayed average noise level	ENP < –35 dBm, termination = 50 Ω, normalized to 1 Hz RBW, meas. length: 40 ms	
	4 GHz to 16 GHz, except: 9.5 GHz to 12.0 GHz	< –152 dBm (1 Hz)
	16 GHz to 17 GHz	< –150 dBm (1 Hz)



Measured at R&S®CMX500, port 3: displayed average noise level

Isolation of IF ports	IF In_x to IF In_y	–30 dB (nom.)

Error vector magnitude	5G NR PUSCH, channel bandwidth: 100 MHz, full allocation, SCS: 60 kHz/120 kHz, modulation: 64QAM, in temperature range from +15 °C to +35 °C, within ±5 °C from last I/Q alignment procedure temperature, for signal with PAR = 11.8 dB, port 1	
	4 GHz to 6 GHz, P from –38 dBm to 0 dBm (RMS)	< –38 dB (meas.)
	6 GHz to 14 GHz, P from –32 dBm to 0 dBm (RMS)	< –38 dB (meas.)
	14 GHz to 17 GHz, P from –32 dBm to 0 dBm (RMS)	< –38 dB (meas.)

Bandwidth		up to 1 GHz

Harmonic response	second harmonic	> 45 dB (nom.)
	third harmonic	> 70 dB (nom.)

mmWave RF analyzer

Only in combination with accessories R&S®CMXHEAD30 remote radio head and R&S®CM-Z30A connection cable.

The R&S®CMXHEAD30 is a separate compact unit that performs upconversion and downconversion to 5G NR FR2 frequencies.

Duplex mode		half duplex (TDD)

R&S®CMXHEAD30	RF1, RF2	wear adapter, 2.4 mm (Q), female
Frequency range	28 GHz band	24.25 GHz to 31.80 GHz
	39 GHz band	37.00 GHz to 43.50 GHz
	frequency extension narrowband spectrum emission mask, 28 GHz band	23.45 GHz to 24.25 GHz
	frequency extension narrowband spectrum emission mask, 39 GHz band	43.50 GHz to 44.30 GHz
Frequency resolution		< 0.1 Hz
Frequency uncertainty		same as timebase + frequency resolution

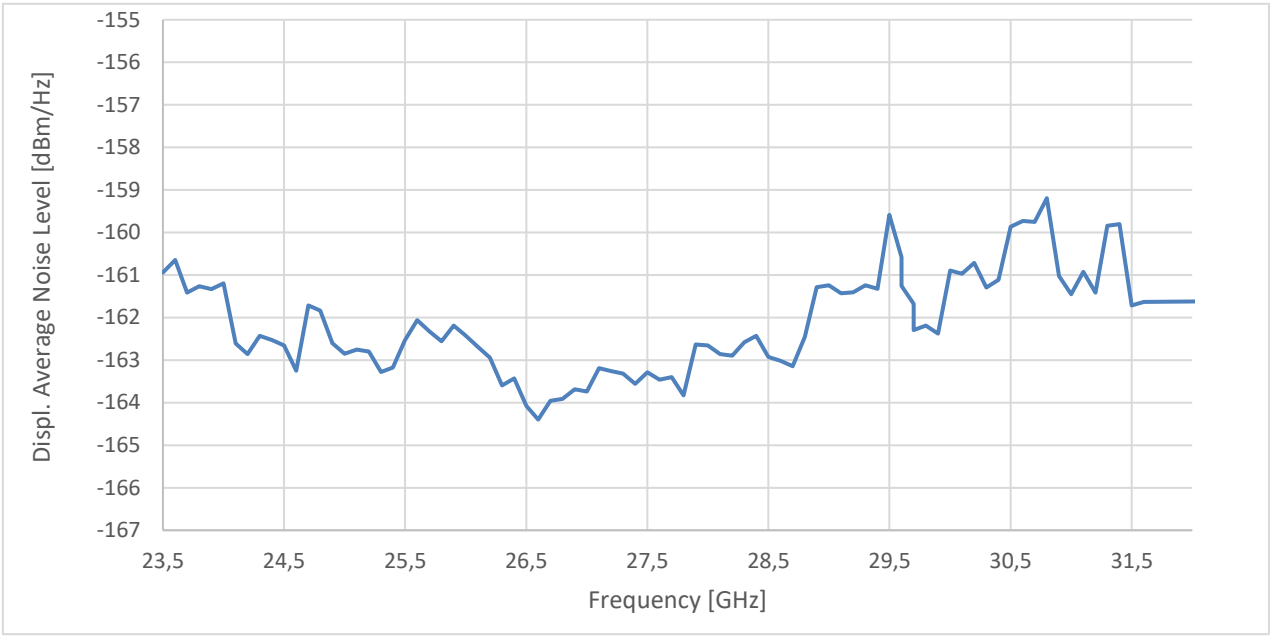
Level range, absolute maximum values		0 V DC
	highest attenuation, lowest sensitivity	+20 dBm, CW
	lowest attenuation, highest sensitivity	+8 dBm, CW

Expected nominal power setting range	PEP, for ADC full scale	
	28 GHz band	–15 dBm to +15 dBm
	39 GHz band	–15 dBm to +15 dBm

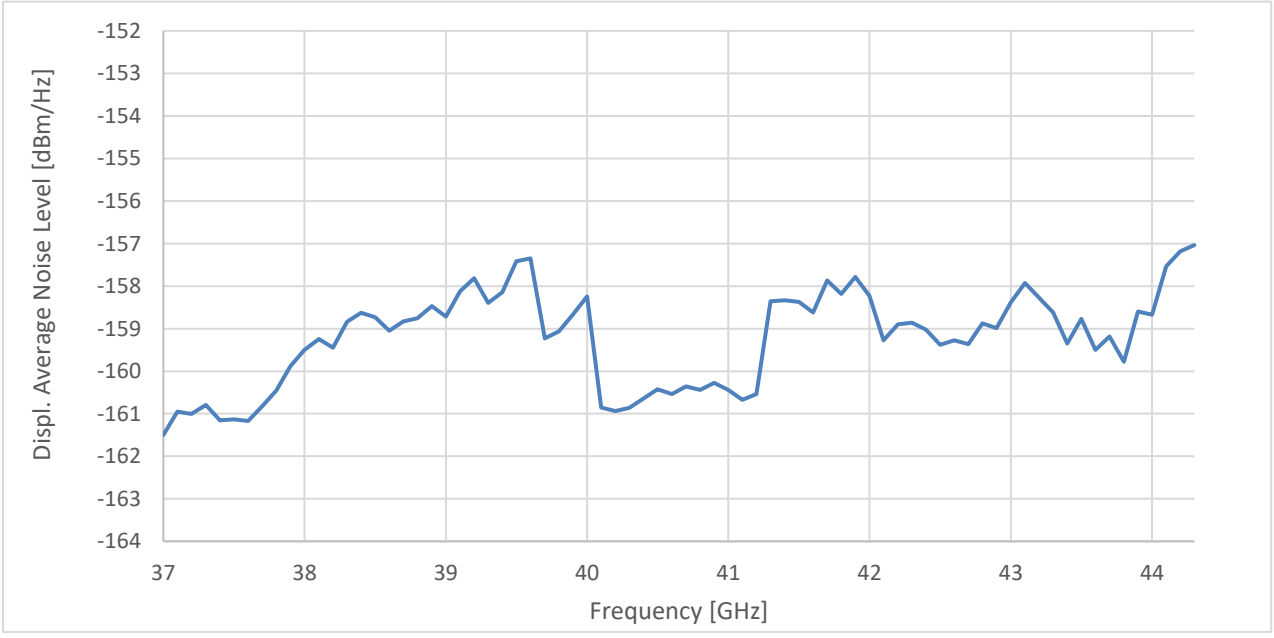
Level uncertainty	in temperature range from +15 °C to +35 °C, no overranging, within ±5 °C from last level alignment procedure temperature	
	28 GHz band, P from –55 dBm to +15 dBm, PEP	< 2.5 dB
	39 GHz band, P from –55 dBm to +15 dBm, PEP	< 3.0 dB
	in temperature range from +15 °C to +35 °C, no overranging, within ±5 °C from last level alignment procedure temperature, firmware version (base) ≥ 4.0.7 and hardware code of TRX_BB (part of R&S®CMP-B500A IF unit) < 11	
	28 GHz band, except 30.12 GHz to 30.48 GHz and 31.40 GHz to 31.68 GHz, P from –55 dBm to +15 dBm, PEP	< 3.5 dB
	39 GHz band, except 41.20 GHz to 42.00 GHz, P from –55 dBm to +15 dBm, PEP	< 4.0 dB

Level repeatability	typical values after 1 h warm-up time, always returning to same level and frequency, no temperature change, insignificant time change	< 0.2 dB

Displayed average noise level	ENP < –35 dBm, termination = 50 Ω, normalized to 1 Hz RBW, meas. length: 40 ms	
	23.5 GHz to 29.6 GHz	< –155 dBm (1 Hz)
	29.7 GHz to 31.8 GHz	< –154 dBm (1 Hz)
	37.0 GHz to 43.5 GHz	< –152 dBm (1 Hz)
	43.6 GHz to 44.3 GHz	< –150 dBm (1 Hz)



Measured at R&S®CMXHEAD30 remote radio head, RF1: displayed average noise level from 23.5 GHz to 31.8 GHz



Measured at R&S®CMXHEAD30 remote radio head, RF1: displayed average noise level from 37 GHz to 44.3 GHz

Error vector magnitude	5G NR PUSCH, channel bandwidth: 100 MHz, full allocation, SCS: 60 kHz/120 kHz, modulation: 64QAM, in temperature range from +15 °C to +35 °C, within ±5 °C from last I/Q alignment procedure temperature, for signal with PAR = 11.8 dB	
	24.25 GHz to 31.80 GHz, P from –35 dBm to –2 dBm (RMS)	< –36 dB (meas.)
	37.0 GHz to 40.0 GHz, P from –32 dBm to –6 dBm (RMS)	< –36 dB (meas.)
	40.0 GHz to 43.5 GHz, P from –25 dBm to –6 dBm (RMS)	< –35 dB (meas.)

Frequency error	5G NR PUSCH, 11 OFDM symbols per slot, mapping type A and single-symbol DM-RS configuration type 1 with 2 additional DM-RS symbols, for RF frequency error measurements relative to the downlink signal	< ± 0.01 ppm, as specified in 3GPP TS 38.521-2 V16.5.0 and TS 38.521-3 V16.5.0

Isolation	RF1 to RF2	> 27 dB, 35 dB (typ.)

Spectrum measurements

FFT spectrum analyzer

Frequency span		10 MHz, 20 MHz, 40 MHz, 160 MHz, 250 MHz, 500 MHz, 1 GHz
FFT length		1k, 2k, 4k, 8k, 16k
Detector		peak, RMS

General data

Remote control interfaces (rear panel)		
LAN		Ethernet RJ-45 connector, 1000 Mbps
USB device		USB 3.0 type B connector

Trigger interfaces (rear panel)		
Trig. A, Trig. B	trigger input/output	2 × BNC connector, 3.3 V TTL
Trig. C, Trig. D, Trig. E	trigger input/output	3 × BNC connector, 3.3 V TTL
AST Out	absolute system time	1 × BNC connector

SYNC interface (rear panel)	multi CMX synchronization	
In	input	1 × mini SAS HD connector
Loop	input/output	2 × mini SAS HD connector
Out	output	1 × mini SAS HD connector

Further interfaces (rear panel)		
USB	for keyboard, mouse, USB flash drive	2 × USB 2.0 and 2 × USB 3.0 type A connector
DVI Digital only	for external monitor	DVI-D connector
DisplayPort	for external monitor	DisplayPort connector

Further interfaces (front panel)		
USB	for keyboard, mouse, USB flash drive	2 × USB 2.0 and 1 × USB 3.0 type A connector
Sensor	for R&S®NRP-Zxx power sensors	8-pin socket

Display		
Size		1.9" e-paper TFT EPD black/white display
Resolution		144 × 128 pixel

Environmental conditions		
Temperature	operating temperature range	+5 °C to +45 °C
	storage temperature range	–25 °C to +60 °C
Damp heat		+40 °C, 80 % rel. humidity, steady state, in line with EN 60068-2-78

Product conformity		
Electromagnetic compatibility	EU: in line with EMC Directive 2014/30/EC	applied harmonized standards: • EN 61326-1 (industrial environment) • EN 61326-2-1 • EN 55011 (class A)
Electrical safety	EU: in line with Low Voltage Directive 2014/35/EC	applied harmonized standard: EN 61010-1
	USA/Canada	applied standards: • UL 61010-1 • CAN C22.2 No. 61010.1
RoHS	EU: in line with Directive 2011/65/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment	EN 50581

Mechanical resistance	nonoperating mode	
Vibration	sinusoidal	5 Hz to 55 Hz, 0.3 mm double amplitude const., 55 Hz to 150 Hz, 0.5 g const., in line with EN 60068-2-6
	random	10 Hz to 300 Hz, acceleration 1.2 g (RMS), in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810, method 516, procedure I

Power rating	power supply with two AC power connectors	
Rated voltage		100 V to 240 V AC (± 10 %)
Rated frequency		50 Hz to 60 Hz (± 5 %)
Rated current	each AC power connector	max. 8.9 A to 3.7 A
Power consumption	instrument with R&S®CMX-PB70B and 2 × R&S®CMX-B200A and R&S®CMX-B300A and 2 × R&S®CMX-B500A	approx. 1400 W
	with additional accessories: 2 × R&S®CMXHEAD30 and 6 × R&S®NRPMx	approx. 130 W
	standby, with OCXO warm/cold	max. 6 W/10 W

Dimensions	W × H × D, overall	444.5 mm × 328.8 mm × 610.0 mm (17.50 in × 12.95 in × 23.99 in)
	for rackmounting	19" 1/1, 7 HU, 550
Weight	instrument with R&S®CMX-PB70B and 2 × R&S®CMX-B200A and R&S®CMX-B300A and 2 × R&S®CMX-B500A	approx. 41 kg (91 lb)

Calibration interval		12 months

Extras

R&S®CMXHEAD30 remote radio head

General data

Interfaces		
RF1, RF2	µW	wear adapter, 2.4 mm (Q), female
IF In	IF input	SMA
IF Out	IF output	SMA
RRH Ref	500 MHz reference frequency	SMA
Power and control	proprietary interface	10-pin socket

Environmental conditions		
Temperature	operating temperature range	+5 °C to +45 °C
	storage temperature range	–25 °C to +60 °C
Damp heat		+40 °C, 80 % rel. humidity, steady state, in line with EN 60068-2-78
Product conformity		
Electromagnetic compatibility	EU: in line with EMC Directive 2014/30/EC	applied harmonized standards: • EN 61326-1 (industrial environment) • EN 61326-2-1 • EN 55011 (class A)

Electrical safety	EU: in line with Low Voltage Directive 2014/35/EC	applied harmonized standard: EN 61010-1
	USA/Canada	applied standards: • UL 61010-1 • CAN C22.2 No. 61010.1
RoHS	EU: in line with Directive 2011/65/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment	EN 50581

Mechanical resistance	nonoperating mode	
Vibration	sinusoidal	5 Hz to 55 Hz, 0.3 mm double amplitude const., 55 Hz to 150 Hz, 0.5 g const., in line with EN 60068-2-6
	random	10 Hz to 300 Hz, acceleration 1.2 g (RMS), in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810, method 516, procedure I

Dimensions	W × H × D, overall	245 mm × 185 mm × 38 mm (9.65 in × 7.28 in × 1.50 in)
Weight		approx. 2.2 kg (4.9 lb)

R&S®CM-Z30A remote radio head connection cable

Connection cable, R&S®CMX500 ↔ R&S®CMXHEAD30	IF In, IF Out	SMA
	RRH Ref	SMA
	RRH Control	10-pin connector
R&S®CM-Z30A	length	3 m
	IF attenuation, at 8 GHz	4 dB (nom.)

Ordering information

Designation	Type	Order No.
Radio communication tester; instrument with following accessories: power cords, operating manual (getting started), R&S®CMX-B300A cables, R&S®CMX-PB70B cables	R&S®CMX500	1201.0002K70
R&S®CMX500 basic assembly	R&S®CMX-PB70B	1222.0676.03
R&S®CMX accelerator unit	R&S®CMX-B200A	1222.0747.02
R&S®CMX processing unit	R&S®CMX-B300A	1222.0801.02
R&S®CMX IF unit	R&S®CMX-B500A	1222.0924.02
Extras		
Remote radio head	R&S®CMXHEAD30	1201.0002K73
Hardware unit	R&S®CMXH-B73A	1430.9106.02
Remote radio head connection cable, length: 3 m	R&S®CM-Z30A	1212.1040.02
Monitor	R&S®CMX-ZG100A	1222.3100.02
Monitor mount	R&S®CMX-Z101A	1222.3098.02
19" adapter, 7 HU, 1/1	R&S®ZZA-KN7	1175.3062.00

Service options		
Extended warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty, three years	R&S®WE3	
Extended warranty, four years	R&S®WE4	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with calibration coverage, three years	R&S®CW3	
Extended warranty with calibration coverage, four years	R&S®CW4	
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	
Extended warranty with accredited calibration coverage, three years	R&S®AW3	
Extended warranty with accredited calibration coverage, four years	R&S®AW4	

Extended warranty with a term of one to four years (WE1 to WE4)
Repairs carried out during the contract term are free of charge [1]. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration (CW1 to CW4)
Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs [1] and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

Extended warranty with accredited calibration (AW1 to AW4)
Enhance your extended warranty by adding accredited calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated under accreditation, inspected and maintained during the term of the contract. It includes all repairs [1] and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

For more ordering information about available options, please contact your local Rohde & Schwarz expert to find the solution that best meets your needs.

[1] Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

Service that adds value

- ► Worldwide
- ► Local and personalized
- ► Customized and flexible
- ► Uncompromising quality
- ► Long-term dependability

Rohde&Schwarz

The Rohde&Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com

Sustainable product design

- ► Environmental compatibility and eco-footprint
- ► Energy efficiency and low emissions
- ► Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

Rohde&Schwarz training

www.training.rohde-schwarz.com

Rohde&Schwarz customer support

www.rohde-schwarz.com/support

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Data without tolerance limits is not binding | Subject to change

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